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JEE

Prayas JEE (2025)

Physics

Wave Optics

DPP: 1

Q1 If A is the amplitude of the wave coming from a point source at distance r then
(A) $A \propto r^{-2}$
(B) $A \propto r^{-1}$
(C) $A \propto r^{2}$
(D) $A \propto r^{1}$

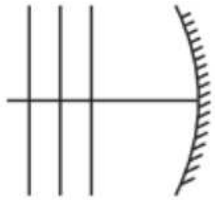
Q2 How does the intensity (I) of a wave depend on distance (r) from a line source?
(A) $I \propto r^{-1}$
(B) $I \propto r^{-2}$
(C) $I \propto r$
(D) $I \propto r^{1/2}$

Q3 Wave front means
(A) All particles in it have same phase
(B) All particles have opposite phase of vibrations
(C) Few particles are in same phase, rest are in opposite phase
(D) None of these

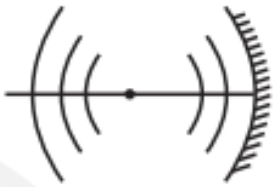
Q4 The ratio of intensities of two waves are given by $4:1$. The ratio of the amplitudes of the two waves is
(A) $2:1$ (B) $1:2$
(C) $4:1$ (D) $1:4$

Q5 In Huygens principle, the relation between wavefront and the ray of light is
(A) Ray of light is perpendicular to the wavefront
(B) Ray of light is parallel to the wavefornt
(C) Ray of light is tangential to the wavefront
(D) Ray of light coincides exactly with the wavefront

Q6 Plane wavefronts are incident on a spherical mirror as shown in the figure. The reflected wavefronts will be



(A)



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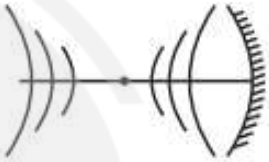

(C)

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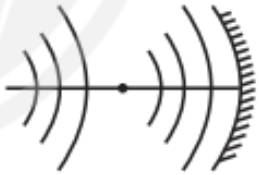

Q7 Spherical wavefronts shown in figure, strike a plane mirror. Reflected wavefront will be as shown in

(A)

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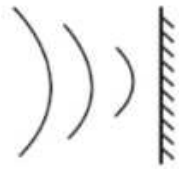
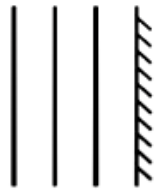
(B)



(C)

(D)



Q8 The phase difference corresponding to path difference of x is
(A) $\frac{2\pi x}{\lambda}$
(B) $\frac{2\pi\lambda}{x}$
(C) $\frac{\pi x}{\lambda}$
(D) $\frac{\pi\lambda}{2x}$

Q9 If two coherent sources are vibrating in phase then we have constructive interference at any point P whenever the path difference is
(A) $\left(n+\frac{1}{2}\right)\lambda$
(B) $\frac{n\lambda}{2}$
(C) $\left(n-\frac{1}{2}\right)\lambda.$
(D) $n\lambda$

Q10 Two coherent sources of intensities I_1 and I_2 produce an interference pattern. The maximum intensity in the interference pattern will be
(A) I_1+I_2
(B) $I_1^2+I_2^2$
(C) $(I_1+I_2)^2$
(D) $(\sqrt{I_1}+\sqrt{I_2})^2$

Q11 The resultant amplitude of a vibrating particle by the superposition of the two waves $y_1=a\sin\left[\omega t+\frac{\pi}{3}\right]$ and $y_2=a\sin\omega t$ is
(A) a
(B) $\sqrt{2}a$
(C) $2a$
(D) $\sqrt{3}a$

Q12 Ratio of intensities of two light waves is given by $4:1$. The ratio of the amplitudes of the waves is
(A) $2:1$ (B) $1:2$
(C) $16:1$ (D) $1:4$

Q13 Two coherent monochromatic light beams of intensities I and $4I$ are superposed. The maximum and minimum possible intensities in the resulting beam are
(A) $5I$ and I
(B) $5I$ and $3I$
(C) $9I$ and I
(D) $9I$ and $3I$

Q14 The ratio of intensities of two waves is $9:1$. They are producing interference. The ratio of maximum and minimum intensities will be
(A) $10:8$ (B) $9:1$
(C) $4:1$ (D) $2:1$

Q15 If two light waves having same frequency have intensity ratio $4:1$ and they interfere, the ratio of maximum to minimum intensity in the pattern will be
(A) $9:1$
(B) $3:1$
(C) $25:9$
(D) $16:25$

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Answer Key

Q1	(B)	Q9	(D)
Q2	(A)	Q10	(D)
Q3	(A)	Q11	(D)
Q4	(A)	Q12	(A)
Q5	(A)	Q13	(C)
Q6	(A)	Q14	(C)
Q7	(C)	Q15	(A)
Q8	(A)		

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Hints & Solutions

Note: scan the QR code to watch video solution

Q1 Video Solution:

Q2 Video Solution:

Q3 Video Solution:

Q4 Video Solution:

Q5 Video Solution:

Q6 Video Solution:

Q7 Video Solution:

Q8 Video Solution:

Q9 Video Solution:

Q10 Video Solution:

Q11 Video Solution:

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Q12 Video Solution:

Q13 Video Solution:

Q14 Video Solution:

Q15 Video Solution:

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